

WHAT IS CLAIMED IS:

1. A hillock-free gate layer, the gate layer comprising:

At least one pure aluminum layer, formed on the substrate; and

an aluminum layer containing nitrogen, formed on the pure aluminum

5 layer, the aluminum layer containing nitrogen;

wherein the aluminum layer containing nitrogen prevents the pure aluminum layer from generating hillocks.

2. The gate layer according to claim 1, wherein the aluminum layer containing nitrogen is an aluminum-nitride (AlN) layer.

- 10 3. The gate layer according to claim 1, wherein the aluminum layer containing nitrogen is an aluminum-oxide-nitride (AlON) layer.

4. A method of manufacturing a hillock-free gate layer, for preventing the formation of hillocks, the method comprising the steps of:

- (a) forming at least one pure aluminum layer on a substrate under a
15 first pressure and a first sputtering power, wherein the first pressure is in the range of 0.5Pa to 4Pa, and the first sputtering power is in the range of 0.1

W/cm² to 10W/cm²; and

(b) forming an aluminum layer containing nitrogen on the pure aluminum layer under a second pressure and a second sputtering power, wherein the thickness of the aluminum layer containing nitrogen is about
5 100Å to 1000Å.

5. The method according to claim 4, wherein the first pressure is preferably 1Pa.

6. The method according to claim 4, wherein the second pressure is 0.3 Pa.

10 7. The method according to claim 4, wherein the thickness of the aluminum layer containing nitrogen is preferably in the range of about 300Å to 800Å.

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